

Forum: Environmental Committee (EC)

Issue: Imposing measures tackling the particulate pollution in Southern Asian countries

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INTRODUCTION

For a long time now, air pollution has become a hot topic in science and politics. Despite its significance, air pollution remains one of the most serious social and environmental problems. Some of the nations most at risk from climate change are found in South Asia. The most polluted nations on the planet are all located in South Asia. Pakistan, Bangladesh, India, and Nepal are among the top five most polluted nations in the world. Government, civic society, and businesses in the nations of South Asia are paying increasing attention to high levels of urban air pollution. Human health is at risk, while poor air quality also contributes to climate change in other ways. In the years to come, a rising proportion of people will be impacted by urban air pollution as rural to urban migration continues. According to the United Nations environment research, despite the rapid economic expansion, Asia's air quality would remain unchanged through 2030 if current rates of administration and enforcement are maintained. However, remaining motionless is insufficient. Below 8% of people who are living in Asia currently breathe "clean air," as defined by the World Health Organization (WHO).¹ That implies that in 2030, an approximated four billion people in the world in Asia are still going to breathe air that is harmful to their health.

In addition to harming people's health, polluted air has a number of negative repercussions on prosperity and economic progress. These include decreased agricultural output, climatic consequences, and negative tourism-related effects. In low- and

¹"9 out of 10 People Worldwide Breathe Polluted Air, but More Countries Are Taking Action." *WHO | World Health Organization*, 2 May 2018, www.who.int/news/item/02-05-2018-9-out-of-10-people-worldwide-breathe-polluted-air-but-more-countries-are-taking-action.

middle-income countries, the poor and women are disproportionately affected by air pollution. Many of the causes and effects of air pollution go across political lines, which makes tackling the issue more challenging.

DEFINITION OF KEY-TERMS

Southern Asian countries²

South Asia is a part of Asia which includes the countries of Bangladesh, Bhutan, India, Pakistan, Nepal, Sri Lanka and Afghanistan. The Maldives are also often considered part of Southern Asia.

Greenhouse Effect³

When greenhouse gas emissions (air pollutants, such as CO₂, Methane, and others) in the atmosphere collect solar heat and redirect it to the Earth rather than allowing it to escape, this phenomenon is known as the greenhouse effect. This might result in increased global warming.

Greenhouse Gasses⁴

Gasses known as greenhouse gasses are capable of retaining large amounts of heat. They permit sunlight to penetrate the atmosphere but prevent the heat it produces from escaping by trapping it. The most prevalent greenhouse gasses are as follows: water in vapor form.

Climate Change⁵

² "South Asia." *Encyclopedia Britannica*, www.britannica.com/place/South-Asia.

³ "Homepage -." *DCCEEW*, <https://www.dcceew.gov.au/>.

⁴ "Meet the Greenhouse Gases!" *NASA*, <https://climatekids.nasa.gov/greenhouse-cards/>.

⁵ "Overview: Weather, Global Warming and Climate Change." *NASA*, <https://climate.nasa.gov/resources/global-warming-vs-climate-change/>.

Climate change is the name given to a long-term change in Earth's climates that has occurred in recent years. These changes have a wide range of effects that are essentially synonymous with the term.

PM2.5 particles⁶

PM2.5 relate to particles that are fewer than 2.5 micrometers in diameter and are suspended for a longer period of time. Fuel combustion and atmospheric chemical processes result in the formation of these particles. Examples include pollen, dust, and spores. When its levels are high, PM2.5, which are microscopic airborne particles, decrease visibility and make the air appear murky.

Environmental Justice

All people must be treated fairly and given the opportunity to actively participate in the development, adoption, and implementation of environmental regulations, and policies in order for there to be environmental justice. Moreover, it implies that no society is disproportionately impacted by the adverse environmental effects brought on by commercial, municipal, and industrial operations or by the application of national, state, and local laws, rules, and policies.

BACKGROUND INFORMATION

Causes of air pollution

As a result of emissions from a variety of sources, long-distance transmission of pollutants from far away, and intricate atmospheric processes, the amount of atmospheric pollutants in the air is determined. Studies on air quality modelling are utilized to comprehend these problems. An atmospheric brown cloud made up of hydroxides, nitrates, organic pollutants, black carbon, fly ash, and other pollutants is a particular issue for South Asia. This haze is mostly caused by burning biomass, fast industry, and urbanization. In Bangladesh's rural areas, biomass fire for cooking is especially common. Burning trash in the open is another custom.

⁶ "Department of Health." *Fine Particles (PM 2.5) Questions and Answers*, https://www.health.ny.gov/environmental/indoors/air/pmq_a.htm.

During dry seasons, more specifically during spring, winter and late autumn, dust from work and vehicle activity is a significant issue in urban areas. Pollutants imported from other nations are also transported, which has a negative impact on air quality. Due to the fact that agricultural stubble burning occurs in the nearby regions of Punjab in both Pakistan and India, this problem is particularly significant. As a result, grass burning in India impacts Pakistan's air quality and vice versa. Issues with trans-boundary air pollution are also caused by other sources of pollution.

According to research on source apportionment, fossil fuel burning contributes between 22 and 70 percent of India's urban pollution. 9 to 31% of the urban air pollution was brought on by biomass combustion.⁷ The continuous suspension of dirt was the cause of up to half of the fine particulate matter in residential areas (PM10). With a greater contribution from organic matter in some locations, a similar approach was seen for Pakistan and Bangladesh. Lahore's ambient fine particulate matter concentrations were determined to be among the greatest ever observed. Bangladeshi measurements of pollutants such as PM10 and PM2.5 are significantly higher than the required limit. While slightly lower in Nepal, PM10 concentrations are slightly higher in India. Sulfur dioxide concentrations, however, seem to be larger in Bangladesh. According to the public opinion survey conducted for this research, the top five pollutant sources varied little among the various south Asian nations. In all four countries, road dust was found to be a significant cause of ambient air pollution.

Key Pollutants

Particulate matter

PM10 and PM2.5, often known as particulate matter, are small particles having diameters between 2.5 and 10 micrometers, accordingly. Exposure is connected to cardiovascular and respiratory illnesses as well as the possibility of cancer.

⁷*The Combined Effect of Reduced Fossil Fuel Consumption and Increasing ...*
https://www.researchgate.net/publication/315329533_The_combined_effect_of_reduced_fossil_fuel_consumption_and_increasing_biomass_combustion_on_Athens'_air_quality_as_inferred_from_long_term_CO_measurements.

Sulfur Dioxide

A gas that is produced when fossil fuels are burned and has a strong stench. Sulfur dioxide, or SO₂, can create acid rain when mixed with water and air, which can pose a potential risk to a human's respiratory system.

Nitrogen Oxides

This set of gasses, which are generated by cars and trucks, industrial pollutants, and forest fires, is a key component of acid rain. Asthma may develop as a result of exposure to oxides of nitrogen, often known as NO_x.

Black Carbon

Black carbon, which is produced when biomass and fossil fuels are burned inefficiently, makes up a significant portion of PM_{2.5}.

Methane

Methane emissions, which are mostly produced by the decomposition of biomass residues, can result in the formation of tropospheric ozone.

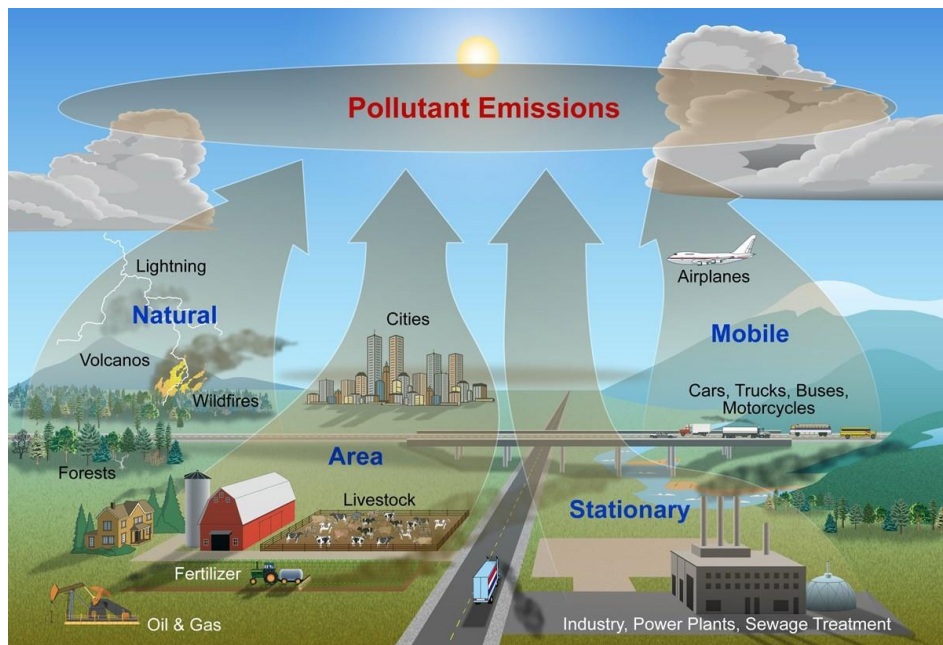
Hydrofluorocarbons

This greenhouse gas, commonly known as CFCs, is used in air conditioners, freezers, cleaners, foam blowing agents, and aerosols. It has a particularly strong impact on global warming. These contaminants cause air pollution, which is a prevalent issue in Asia Pacific nations and towns. They seriously endanger the health of people and the environment, particularly in developing nations.

Sources of air pollution

According to the Environmental Protection Agency(EPA), more than half of the air pollution in the United States comes from mobile sources, with cars being the main

contributor of air pollution from mobile sources. Primary pollutants are stationary sources like power plants that produce significant volumes of pollutants from a particular location. Area sources are made up of numerous smaller pollution sources that, when taken individually, aren't a huge concern but may be when examined together. Natural sources can occasionally have a big impact, but they rarely contribute to continuous air pollution issues like some other sources can. Both naturally occurring and man-made pollution are frequently produced in one location and moved through the air. Pollutants can occasionally undergo changes in the atmosphere prior to deposition. Haze from air pollution can make it difficult to see, and particle accumulation can have biological impacts. The same impacts occur in NPS areas as elsewhere. Which sources of air pollution are most significant for each park can be determined by position and also the time of year. Smog levels can rise in parks near power stations without adequate pollution controls. Ozone levels are increased by industrial operations like oil and gas production as well as tailpipe emissions from automobiles. Wildfires in the summertime can also make it harder to see in NPS areas.



8 Figure 1: Sources of air pollution and their producers

⁸“Where Does Air Pollution Come from?” *National Parks Service*, U.S. Department of the Interior, <https://www.nps.gov/subjects/air/sources.htm>.

Health impacts of air pollution

The majority of people in Europe reside in locations, particularly cities, where air pollution can be very bad. Numerous illnesses, including stroke, chronic obstructive pulmonary disease, trachea, bronchus, and lung malignancies, worsened asthma, and lower respiratory infections, can be brought on by both short-term and long-term exposure to air pollution. Evidence of connections between exposure to air pollution and type 2 diabetes, obesity, systemic inflammation, Alzheimer's disease, and dementia is provided by the World Health Organization (WHO). According to the International Agency for Research on Cancer, PM2.5 in particular is a major contributor to cancer. Chronic exposure can have an impact on every organ in the body, complicating and aggravating pre-existing medical issues, according to a new global assessment.

People are impacted by air pollution in various ways. Children, the elderly, those with pre-existing diseases are particularly vulnerable to the negative effects of air pollution on their health. Furthermore, the most marginalized members of society frequently have worse health and also less access to the best medical care, which makes them more vulnerable.



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Figure 2: “Air pollution the silent killer”

Social impacts of air pollution

Along with all the other impacts that air pollution has on the people, air pollution has contributed to several social impacts as well. When we are talking about social impacts of air pollution the terms that are used are "environmental equity", "environmental racism" and "environmental justice". Those terms have sparked a debate that has to do with the differences in environmental exposures and associated health hazards between low-income, racial/ethnic minority, and urban communities and the general population. A form of racial discrimination known as "environmental racism" occurs when racial minorities are disproportionately subjected to health risks due to laws and practices that require them to reside close to toxic waste sources such as sewage plants, mines, landfills, power plants, and

⁹“WHO/Europe | Home.” *World Health Organization*, World Health Organization, <https://www.who.int/europe/home?v=welcome>.

major roads. As a result, these communities are more likely to experience the health effects of toxic chemicals.

Economic impacts of air pollution

Pollution levels have a negative impact on the economy in a number of ways, including by costing lives, impairing people's capacity to work, affecting essential goods like food, destroying cultural and historical landmarks, and increasing the cost of ecosystem repair and restoration. The development of new technologies that help reduce emissions is ongoing. Setting air pollution emission limit values has shown to be a successful instrument for encouraging investment in renewable energy technologies. In many instances, the advantages of better technology for reducing emissions have been quantified. According to economic models, more actions will result in job losses in some areas, but job gains in other sectors. Long-term environmental policy will benefit the economy because it encourages more resource-efficient use, and the health advantages would boost GDP by up to 10%. The prices of manufacturing the necessary equipment and, consequently, the abatement measures, will be decreased as the market for clean technology expands. The opportunities for a developing clean technology economy are increased in the nations that act first.

How can air quality be linked with climate change

Local air quality may be impacted by climate change. The anticipated increase in ground-level ozone due to atmospheric warming brought on by climate change could make it more difficult to comply with ozone guidelines in the future. There is less certainty over how climate change may affect other particulate pollution sources although research is being done to address these concerns.

Pollutant emissions into the atmosphere have the potential to alter the climate. While different types of particulate matter can either warm or cool the environment, ozone in the environment warms the climate. For instance, particulate substances decrease the earth's atmosphere whereas black carbon, particle pollution from burning, contributes to heat the planet.

MAJOR COUNTRIES AND ORGANIZATIONS INVOLVED

Bangladesh

Asia's southernmost region includes the nation of Bangladesh. Bangladesh has some pretty serious problems with its pollutant levels, so much so that it actually takes the top spot among the most polluted countries in the world rankings, and its capital city Dhaka takes the 21st spot in terms of the most polluted places ranked over 2019. This is evident from looking at the pollution readings obtained over the last few years. These are the perspectives that suggest Bangladesh is facing a pollution catastrophe. Even while Bangladesh has numerous places with unique beauty and clean air, especially in rural areas, its highly poor ranking in terms of its pollution levels is attributable to big cities like Dhaka. Rapid urbanization is frequently accompanied by a significant inflow of people moving from the countryside to the cities, which raises pollution levels. Increased demand for homes, more cars, and a boom in all industries all follow population growth. As was already noted, although many parts of Bangladesh would not receive as poor ratings overall, the capital city is the main center for the nation's pollutant levels, and with its expanding population, a response to these appalling levels of smoke, haze, and toxins is essential.

India

In a 2019 global survey, it was found that India was home to 21 of the 30 worst polluted places.¹⁰ In metropolitan regions, industry and automobiles are the main sources of pollution, whereas in rural areas, the burning of organic substances is the main source. This substance is utilized as fuel for household stoves as well as for the heaters required to keep homes warm during the winter months. Massive quantities of stubble are burned in the fields during the fall and winter to prepare the soil for the following crop. Compared to the alternative approach of reusing the residue as soil, this process is far less expensive.

Asia Pacific Clean Air Partnership

The Asia Pacific Clean Air Partnership (APCAP) seeks to empower infrastructure facilities, provide technical support on air quality monitoring, serve as a baseline for better communication and integration of clean air initiatives in the area, provide a platform for knowledge generation and sharing on air pollution initiatives, policies, and technologies in the Asia Pacific region, and assist air quality tools to determine clean air solutions.

¹⁰“World's Most Polluted Cities in 2021 - PM2.5 Ranking.” *IQAir*, <https://www.iqair.com/world-most-polluted-cities?continent=&country=&state=&page=1&perPage=50&cities=>

In response to the demand for intervention on air quality at the First Sessions of the United Nations Environmental Assembly between 2014 and 2017, UNEP and its partners established a voluntary partnership in 2015. This was done in order to support the achievement of the pertinent 2030 Agenda For sustainable development.

Acid Deposition Monitoring Network in East Asia

A scientific network called the Acid Deposition Monitoring Network in East Asia was set up in 1998 to promote cooperation in the fight against acid deposition and associated atmospheric pollution. By giving information and data to decision-makers and promoting collaboration across member nations, it seeks to foster a shared knowledge of the issues with acid deposition. The network's secretariat is housed at the UN Environment.

Climate and Clean Air Coalition

The Climate and Clean Air Coalition is the only international initiative that brings together governments, civil society, and the corporate sector. It is dedicated to enhancing air quality and preserving the climate in the coming decades by lowering short-lived climate emissions across sectors. In addition to reducing Emissions of co₂, the Coalition serves as a catalyst to develop, carry out, and disseminate quick fixes for short-term climate change in order to quickly enhance people's lives and assure sustainable growth for future generations.

Methane, black carbon, but also Hydrofluorocarbons are the Coalition's initial areas of emphasis. Partners understand that global efforts to reduce carbon dioxide, particularly those made in accordance with the United Nations Framework Convention on Climate Change (UNFCCC), must be complemented and supplemented by actions on short-lived climate pollutants, not replaced by it.

Regional Forum on Environment and Health

The Asia-Pacific Regional Forum on Environment and Health was founded in 2007 to provide a forum for national and regional action to improve and protect the environment and human health and to advance the Asia Pacific region's sustainable development. The fourth forum (Manila, 2016) saw participation from 36 different nations, regions, or territories, bringing the overall number of attendees to 217. Aware of how environmental and health objectives shift over time, the Regional Forum on Environment and Health shall

handle environmental and health goals in a way that complements existing efforts by nations and other regional and subregional authorities.

TIMELINE OF EVENTS

Date	Description of event
5-16 June 1972	The First Earth Summit was held in Stockholm. At this summit the UN Environmental Program (UNEP) was formatted.
16 September 1987	The Montreal Protocol treaty was signed. The main goal of this treaty is to protect the ozone layer by adding ozone-depleting substances.
June 3-14, 1992	The Rio Earth Summit and the signing of the Kyoto Protocol took place.
February 16, 2005	The Kyoto Protocol became a legal requirement.
March 1,2012	EPA's Black Carbon Report was signed
December 12, 2015	The Paris Climate Accord was adopted by 167 Parties. The pact seeks to cut global greenhouse gas emissions significantly.
November 4, 2016	The Paris Climate Accord was entered into force.
October, 2018	Initial IMO GHG Strategy was signed
31 October- 12 November,2021	United Nations Climate Change Conference

RELEVANT UN RESOLUTIONS, TREATIES AND EVENTS

The Paris Agreement

The Paris Agreement on Climate Change was formed in 2015 as a result of this support. The agreement's objective is to keep "temperature rise below 2 degrees Celsius over pre-industrial levels, if not below 1.5 degrees Celsius." This agreement's objective was to make it easier to deal with climate change's repercussions. In 2016, the agreement went into effect. Despite the fact that this agreement has the potential to be extremely useful and productive, several countries have failed to follow through on their promises. For example, India, as well as Kenya, are two nations that have rejected climate accountability but are still on track to meet their targets of reducing global warming to 1.5 or 2 degrees Celsius.

10-year Climate Action Plan (UN Secretariat)

The United Nations Secretariat has established a new 10-year Climate Action Plan with the goal of reducing greenhouse gas emissions by 45 per cent and getting 80 percent of power from renewable sources by 2030.¹¹ The plan is in line with the UN system's environmental protection strategy (2020-2030) and the IPCC guidelines. To achieve these goals, the Plan proposes two key types of interventions. The first entails a limited further shift toward renewable energy self-generation ("intensification track"), with current efforts focusing on reducing consumption through behavioral change, improving energy savings, connecting to existing clean energy grids where available, and connecting to existing renewable grids where available. The second entails transformational change through creative and sophisticated solutions that will necessitate external collaborations, such as scaling up new technologies and procuring renewable energy from third party-owned facilities that have not yet been created ("innovation track").

Sustainable Development Goals

The 2030 Agenda for Sustainable Development, was endorsed by all UN Member States in 2015. At its core are the United Nations sustainable development Goals (SDGs),

¹¹"UN Secretariat Adopts Climate Action Plan | Department of Management Strategy, Policy and Compliance." *United Nations*, United Nations, <https://www.un.org/management/news/un-secretariat-adopts-climate-action-plan>.

which are an urgent call to action for all countries, developed and developing, to collaborate in an international partnership. They recognize that in order to completely eradicate poverty and other types of deprivation, efforts must also be made to improve health and education, reduce inequality, and grow the economy, all the while battling climate change and safeguarding our oceans and forests.

Article 13

The 13th goal is the need for urgent action to combat climate change. For many, the availability of fundamental requirements such as freshwater, clean air, food security, and energy will be impacted by climate change, while attempts to address climate change will likewise inform and define the global development agenda. Global warming and sustainability are inextricably linked. Poor and emerging nations, particularly the least developed, would be disproportionately affected and ill-equipped to deal with the expected shocks on their social, economic, and ecological systems. One of the problems linked with climate change are also greenhouse gas emissions and their implications to the planet as a whole.

Kyoto Protocol

The Kyoto Protocol was enacted on December 11, 1997, with the goal of extending the United Nations Framework Convention on Climate Change (UNFCCC) and therefore lowering greenhouse gas emissions. It was not implemented until February 16, 2005, though. This convention aimed to persuade developed countries to reduce greenhouse gas emissions. It admits that developed countries are mostly at fault for recent increases in greenhouse gas emissions in the environment.

Despite its symbolic value, some today regard the Kyoto Protocol as a failure because it did not result in worldwide carbon reductions. Despite the fact that experts have long warned that even rigorous adherence to the Kyoto Protocol will not stop climate change, this strategy took nearly 15 years to develop. Less Economically Developed Countries are harmed by the Kyoto Protocol's nearly sole focus on mitigation (LEDCs).

PREVIOUS ATTEMPTS TO SOLVE THE ISSUE

Clean Air Act

The major federal law governing air quality in the United States is the Clean Air Act (CAA), which aims to lower and regulate air pollution on a national level. One of the first and most important modern environmental laws in the United States, it was initially passed in 1963 and has subsequently undergone numerous amendments. The U.S. Environmental Protection Agency (EPA) oversees the administration of the Clean Air Act, along with many other significant federal environmental laws, in collaboration with regional, local, and tribal governments.

Vehicle inspection

The periodic check of a motor vehicle's emissions control systems is known as vehicle inspection and maintenance (I/M). I/M's initiatives nationwide aim to find and fix high-emitting automobiles and enhance air quality. Programs for vehicle maintenance and inspection (I/M) aim to enhance air quality by identifying automobiles and trucks that have high emissions and may require repairs. In order to keep emissions under permissible levels, owners or operators of cars with high emissions are alerted and asked to make any necessary repairs.

Dust control

In order to comply with safety, health, and environmental regulations, dust control is essential. Airborne dust and fumes are mostly created by mining and material processing processes. Fine particles are kept from getting airborne, endangering crops and vegetation, or negatively affecting human health, by regulating dust. Additionally, dust suppressants prevent these particles from entering streams and other waterways where they could accumulate to unsafe sediment levels for aquatic life.

POSSIBLE SOLUTIONS

Strengthening government control

Several measures have already been implemented in some parts of Asia. However, control should be strengthened. These include restrictions on power plants and sizable industrial facilities, enhanced industrial process and road vehicle emission requirements, extensive and efficient vehicle inspection, upkeep of roads and construction sites, and dust control. Through those measures, gas emission producers would be forced to obey with the control and thus emissions would decrease.

Promotion of sustainability

Solutions that enhance air quality while also supporting other development initiatives, are of utmost importance and should be promoted. Numerous initiatives deal with climate change, including raising the share of renewable energy sources, expanding the use of electric vehicles, enhancing energy efficiency in homes and businesses, enhancing public transportation, recovering methane from optimized solid waste sustainable waste water filtration, and lowering flare-ups and recovering petroleum gas.

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